

COASTAL CONSERVANCY

Staff Recommendation
January 28, 2016

SAN DIEGO BAY NATIVE OYSTER RESTORATION PROJECT

Project No. 13-019-02
Project Manager: Megan Cooper

RECOMMENDED ACTION: Authorization to disburse up to \$313,953 to Southwest Wetlands Interpretive Association to complete studies, designs and engineering for a native oyster restoration project adjacent to San Diego Bay National Wildlife Refuge located in San Diego County.

LOCATION: San Diego Bay National Wildlife Refuge, City of Chula Vista, San Diego County

PROGRAM CATEGORY: Coastal Resource Enhancement

EXHIBITS

Exhibit 1: [Project Location and Site Map](#)

Exhibit 2: [Conceptual Designs for Oyster Reef Structures](#)

Exhibit 3: [Project Letters](#)

RESOLUTION AND FINDINGS:

Staff recommends that the State Coastal Conservancy adopt the following resolution pursuant to Section 31251-31270 of the Public Resources Code:

“The State Coastal Conservancy hereby approves the disbursement of an amount not to exceed three hundred and thirteen thousand nine hundred and fifty three dollars (\$313,953) to Southwest Wetlands Interpretive Association (“SWIA”) to complete studies, designs and engineering that are needed for environmental review and analysis and permit applications for a native oyster restoration project adjacent to the Sweetwater Marsh Unit of the San Diego Bay National Wildlife Refuge located in San Diego County. Prior to the disbursement of funds, SWIA shall submit for review and written approval of the Conservancy’s Executive Officer a work program, including budget and schedule, and any contractors to be employed for these tasks.”

Staff further recommends that the Conservancy adopt the following findings:

“Based on the accompanying staff recommendation and attached exhibits, the State Coastal Conservancy hereby finds that:

1. The proposed authorization is consistent with Chapter 6 of Division 21 of the Public Resources Code, regarding coastal resource enhancement.

2. The proposed project is consistent with the current Conservancy Project Selection Criteria and Guidelines.
 3. The Southwest Wetlands Interpretive Association is a nonprofit organization existing under section 501(c)(3) of the U.S. Internal Revenue Code, and whose purposes are consistent with Division 21 of the Public Resources Code.
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PROJECT SUMMARY:

Staff recommends that the Conservancy authorize the disbursement of up to \$313,953 to the Southwest Wetlands Interpretive Association to complete studies, designs and engineering that are needed for environmental review and analysis and permit applications for a native oyster restoration project adjacent to the San Diego Bay National Wildlife Refuge in San Diego County. This project will create a 2.5 acre “living shoreline” (defined below), containing 0.68 acres of native oyster reef along a 0.38 mile stretch of shoreline in South San Diego Bay off the Sweetwater Marsh Unit of the San Diego Bay National Wildlife Refuge.

The primary goal of the oyster restoration project is to create a biologically rich native oyster reef in San Diego Bay that functions as part of a complete marsh system, thus restoring an ecological niche that was historically present while also working to protect Bay tidelands and shorelines. This native oyster reef and living shoreline will increase resilience to climate change while providing numerous ecosystem services to San Diego Bay tidelands and shorelines by 1) achieving localized reductions in erosive impacts of wave action and severe weather events on the shoreline, in turn ensuring continued flood control services of marshlands; 2) creating new habitat for ecologically and commercially important wildlife and 3) increasing connectivity among fragile wetlands and subtidal lands in southeast San Diego Bay.

San Diego Bay was historically a shallow water system with significant intertidal habitat. However, decades of dredging and channelization have resulted in a loss of over 90% of all intertidal habitats since the late 1800s. At the same time, total wetland area has also declined by over 70%, with additional losses anticipated as a result of climate change-driven sea level rise and tidal inundation.

Shoreline armoring, the dominant shoreline treatment in San Diego Bay, continues to exacerbate this trend of wetland loss, causing increased rates of erosion on armor-adjacent lands, preventing natural shoreline processes and sediment flows, and providing little to no functional habitat for aquatic species. The loss of shallow water and salt marsh habitats has increased the vulnerability of the Bay’s shoreline communities to extreme weather events and flooding. Protection of the Bay’s remaining marsh interface areas is essential if healthy ecosystems and coastal infrastructure are to be sustained. Today, with climate change and sea level rise further threatening San Diego Bay’s ecological and economic resources, sustainable shoreline protection strategies must be developed in order to promote the resilience of the Bay’s marshland habitats and fisheries to increased temperatures, weather extremes, and rising waters.

Living shorelines present a resilient and long-term structural response to these concerns, providing an ecologically stable alternative to the destructive effects of shoreline armoring.

Construction of a living shoreline in the form of a native oyster reef can help serve as a natural levee, reducing wind wave and boat wake energy along marsh shorelines while simultaneously restoring ecological functions to the estuarine system. This small-scale living shoreline demonstration project will increase understanding of how living shorelines can help promote wetland accretion in the face of rising tides while also restoring habitat benefiting numerous aquatic and avian species.

Native Olympia oysters (*Ostrea lurida*) are particularly well suited for use in construction of a living shoreline project in the Bay as they were a dominant native species until the early 1900s when their populations declined due to over-harvesting, pollution, and loss of wetlands. With a viable native oyster stock still existing in the Bay, providing hard substrate will allow oysters to establish reef populations. As critical building blocks to the benthic community, oysters act as ecosystem engineers, providing structurally complex habitat in which invertebrates and small fish can grow while hiding from predators. Oyster reefs also serve as a food source to fish, ducks, and other invertebrates.

Creation of a living shoreline that utilizes native oyster reef components will provide multiple ecosystem benefits while also increasing the resiliency of the region's coastal salt marsh and shoreline infrastructure to projected climate change impacts. Building off the lessons learned from the Conservancy's San Francisco Bay Living Shorelines Project, this project will serve as an innovative demonstration project for the San Diego region. As such, it shall provide vital data and improve understanding of the creation and use of living shorelines as a structural response to climate change.

With the proposed funding, SWIA will complete studies, design, and engineering that are needed for California Environmental Quality Act (CEQA) review and analysis and for permit applications. Final design and engineering of the selected project alternative and development of construction documents will be completed after CEQA approval, in a later phase of the project.

Site Description:

The project site is 2.5 acres of intertidal zone adjacent to the Sweetwater Marsh Unit of the San Diego Bay National Wildlife Refuge, located in San Diego County. The site was selected from among several possible sites in south San Diego Bay through analysis of wave energy, proximity to high functioning natural salt marsh, and other considerations assessed during development of the *San Diego Bay Native Oyster Restoration Plan* (Merkel, 2015) [see Project History for further details].

The project is located entirely on Port tidelands. As San Diego Unified Port District is a member of the project team, this site placement on lands within the Port's jurisdiction assures that attention to the integrity of the project shall be sustained over the long term. Specifically, the oyster reef will be included within the physical extent of the Port's eelgrass survey monitoring that is conducted every three to five years as well as the Port's fish monitoring program every five years.

Project History:

This project is the result of two years of collaboration between federal, state, local and academic partners united by a shared interest in addressing climate change and shoreline protection in San Diego Bay through alternatives to harmful shoreline armoring practices. Building off the success of the San Francisco Bay Living Shoreline Project, the partners worked together to move the idea of restoring San Diego Bay’s native oysters within a living shoreline demonstration project from concept to implementation-ready project.

In 2013, the Coastal Conservancy (funded through a NOAA grant) and the San Diego Unified Port District (SDUPD) awarded a grant to SWIA to develop the *San Diego Bay Native Oyster Restoration Plan* (“the Conceptual Plan”) (Merkel and Associates, 2015). The Conceptual Plan included native oyster population surveys in San Diego Bay, wave and current modeling, restoration site feasibility analysis, and design of scientific monitoring protocols necessary to guide a multi-year restoration and scientific study effort. It drew heavily upon lessons learned from the first living shoreline project of its kind in California, the Conservancy’s San Francisco Bay Living Shorelines Project, and also built upon knowledge gained through native oyster restoration programs in southern California including those underway in Newport and Alamitos Bays (also funded by the Conservancy). Results of the Conceptual Plan led directly to this current project phase.

PROJECT FINANCING

Coastal Conservancy	\$313,953
USFWS	\$60,000
<u>San Diego Unified Port District</u>	<u>\$150,000</u>
Project Total	\$523,953

The expected source of Conservancy funds for this project is the fiscal year 2015/16 appropriation to the Conservancy from the Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Proposition 1, Water Code § 79700 et seq.). Funds appropriated to the Conservancy derive from Chapter 6 (commencing with § 79730) and may be used “for multi-benefit water quality, water supply, and watershed protection and restoration projects for the watersheds of the state” (Section 79731). Section 79732 identifies specific purposes of Chapter 6 and includes purpose (10) of protecting and restoring coastal watersheds, including, but not limited to bays, marine estuaries, and nearshore ecosystems.

As required by Proposition 1, the proposed project provides multiple benefits. By working to restore San Diego Bay’s nearshore ecosystem, the project will benefit depleted native oyster populations and the aquatic and avian species that rely on structural complexity in the nearshore habitat for forage and protection. This project will also benefit the resiliency of existing salt marsh leeward of the project site to sea level rise, reducing wave energy along the marsh edge so as to allow for sediment accretion within the marsh. Additionally, as a small scale demonstration project, this restoration effort will provide a highly beneficial learning opportunity for the Southern California region on living shoreline design and sustainability.

In accordance with Prop 1 Section 79707(b) which requires agencies to prioritize “projects that

leverage private, federal, or local funding or produce the greatest public benefit”, this project leverages both federal and local funding as noted above. Additionally, as a demonstration project of innovative oyster restoration and living shoreline techniques new to San Diego Bay, the project satisfies Prop 1 Section 79707(e) which grants “special consideration” to “projects that employ new or innovative technology or practices.”

The proposed project was selected through a competitive grant process under the Conservancy’s *Proposition 1 Grant Program Guidelines* adopted in June 2015 (“Prop 1 Guidelines”). (See § 79706(a)). The proposed project meets each of the evaluation criteria in the Prop 1 Guidelines as described in further detail in this “Project Financing” section, the “Project Summary” section and in the “Consistency with Conservancy’s Project Selection Criteria & Guidelines” section of this report.

CONSISTENCY WITH CONSERVANCY’S ENABLING LEGISLATION:

The proposed project would be undertaken pursuant to Chapter 6 of Division 21, Public Resources Code Sections 31251-31270, regarding natural resource enhancement projects.

Consistent with Section 31251, the proposed disbursement would provide funding to a nonprofit agency to undertake activities necessary for the enhancement of a severely depleted natural resource - oyster beds in San Diego Bay – that have been impacted by indiscriminate dredging and filling, improper location of improvements, and human-induced events, and have suffered the loss of natural values. SWIA’s work on this project along with federal and regional partners will help to develop innovative sea level rise adaptation strategy of living shorelines, which provide multiple benefits to the intertidal natural resources in San Diego Bay.

The proposed project is located on Port of San Diego managed tidelands within the City of Chula Vista, and is subject to the Port’s Master Plan (which is certified by the Coastal Commission and serves as the local planning document). As required by Section 31252, the area to be enhanced under the proposed project is identified by the Port Master Plan as requiring public action to resolve the historical impacts to the natural resources of the area. In particular that Plan promotes the “restoration of functional areas which have a high ecological value”, such as former oyster beds. See additional discussion in the “Consistency with Local Coastal Program Policies” section, below.

In determining the amount of Conservancy funding for this project, the factors identified in Section 31253 have been considered and applied, as described in detail below, in the “Consistency with Conservancy’s Project Selection Criteria & Guidelines” section.

CONSISTENCY WITH CONSERVANCY’S 2013 STRATEGIC PLAN GOAL(S) & OBJECTIVE(S), AS REVISED JUNE 25, 2015:

Consistent with **Goal 5, Objective A** of the Conservancy’s 2013-2018 Strategic Plan, the proposed project will develop plans for the restoration and enhancement of coastal intertidal habitat.

Consistent with **Goal 7, Objective B** of the Conservancy’s 2013-2018 Strategic Plan, the proposed project will develop plans for an oyster restoration living shoreline as an adaptive

strategy to address sea level rise and extreme storm events threats to coastal communities and infrastructure in a way that protects natural resources.

CONSISTENCY WITH CONSERVANCY'S PROJECT SELECTION CRITERIA & GUIDELINES:

The proposed project is consistent with the Conservancy's Project Selection Criteria and Guidelines, last updated on October 2, 2014, in the following respects:

Required Criteria

1. **Promotion of the Conservancy's statutory programs and purposes:** See the "Consistency with Conservancy's Enabling Legislation" section above.

2. **Consistency with purposes of the funding source:** See the "Project Financing" section above.

3. **Promotion and implementation of state plans and policies:**

California Water Action Plan (CNRA, CDFA and CalEPA, 2014), Action 4: Protect and restore important ecosystems. Construction of a native oyster reef living shoreline implements this Action by restoring ecologically vital native oyster habitat that provides a myriad of ecological benefits including creation of complex benthic structure, forage opportunities for aquatic and avian species, and structural protection of adjacent native salt marsh habitat.

Integrated Natural Resources Management Plan (INRMP) for San Diego Bay. The INRMP for San Diego Bay was updated in 2011 by the SDUPD and the U.S. Navy, and groups its detailed implementation recommendations under seven core initiatives. One of the INRMP Initiatives seven core is "sustainability by design", which seeks to maintain the SDUPD 's and the Navy's assets as well as the natural resources of the Bay in the face of anticipated climate change and sea level rise. This initiative directly relates to a second core initiative of "habitat enhancement of shoreline structures", which calls for construction of shoreline structures, such as this oyster restoration project, that will achieve multiple objectives including shore stabilization, providing native habitat, contributing to sustainability of the Bay's natural resources, and accommodating expected sea level rise.

San Diego Bay's INRMP identifies improvement of habitat values of shoreline infrastructure to be among the top nine priority projects for implementation. Elsewhere in the INRMP, objectives are established for protecting existing coastal wetlands and expanding these resources where possible.

4. **Support of the public:** This project enjoys strong support from partners in federal and state agencies, the academic community, regional government, the non-profit sector, and elected officials. See Exhibit 3 for project support letters.
5. **Location:** The proposed project would be located within the coastal zone of the City of Chula Vista in San Diego County on tidelands managed by San Diego Unified Port District.
6. **Need:** The proposed project would not occur without Conservancy participation and funding.

7. **Greater-than-local interest:** The California Coastal Commission's 2015 *Sea Level Rise Guidance* calls for the use of non-armored shoreline management approaches in the future. This project would serve as a valuable demonstration project for the region and provide a learning experience to guide future living shoreline projects' development.
8. **Sea level rise vulnerability:** The project is not vulnerable to sea level rise, but rather an innovative adaptive response to sea level rise vulnerabilities. Creating a living shoreline oyster reef in south San Diego Bay would help slow sea level rise-driven shoreline erosion by serving as a horizontal levee that reduces erosive wave energy and promotes natural sediment accretion in adjacent areas of existing coastal salt marsh. As oysters thrive at a wide range of tidal depths, the initial planted population should be able to shift inland as wetlands migrate due to sea level rise.

Additional Criteria

9. **Urgency:** Loss of shallow water and salt marsh habitats has increased the vulnerability of the Bay's aquatic communities as well as the vulnerability of inshore areas to extreme weather events and increase risk of flooding. Protection of the Bay's remaining salt marsh areas is essential if healthy habitats and coastal infrastructure are to be sustained
10. **Resolution of more than one issue:** Creation of a living shoreline in south San Diego Bay will provide valuable habitat to native species, protect fragmented salt marsh habitat that is vulnerable to climate change impacts, help protect coastal infrastructure that relies on existing marsh for buffering from floods, and provide an educational opportunity on non-armored shoreline management solutions for the southern California region.
11. **Leverage:** See the "Project Financing" section above.
13. **Innovation:** Living shorelines projects, such as the one proposed, present an innovative long-term non-armored structural sea level rise adaptation strategy. Native oyster restoration and creation of living shoreline as proposed by this project is a highly innovative, ecologically based approach to addressing sea level rise in Southern California.
14. **Readiness:** The project team has already begun work on the CEQA analysis. The grantee is ready to begin working on the specific tasks defined under this grant as soon as the funding is approved.
15. **Realization of prior Conservancy goals:** See "Project History" above.
17. **Cooperation:** SWIA, San Diego Unified Port District, U.S. Fish and Wildlife Service, and CA State Fullerton cooperated on the development of this project over the past two years and will continue to work together throughout implementation of the project.
18. **Vulnerability from climate change impacts other than sea level rise:** Oysters are adapted to a broad range of salinity, depth, and water temperature, and so are naturally resilient to many of the environmental shifts that may be associated with predicted climate change.

CONSISTENCY WITH LOCAL COASTAL PROGRAM POLICIES:

The Chula Vista Coastal Zone totals approximately 1,345 acres, of which 704 acres are within the City of Chula Vista LCP Planning Area and 554 acres are within the Unified Port of San Diego's jurisdiction. The project is located entirely within an area under the Port's jurisdiction, and the Unified Port of San Diego's "Port Master Plan" has been certified by the Coastal Commission; it serves as the local planning document for the Port's tidelands.

The project is consistent with the goal of the Port Master Plan to "protect, preserve, and enhance natural resources, including natural plant and animal life in the bay as a desirable amenity, an ecological necessity, and a valuable and usable resource", because the project focuses on restoration of native oyster habitats, a valuable ecological resource. The project is also consistent with the Port Master Plan goal to "encourage the protection and restoration of functional areas which have a high ecological value" because the restoration of native oyster habitat will re-establish important ecological functionality that has been lost due to human impacts.

COMPLIANCE WITH CEQA:

The proposed project is statutorily exempt from the provisions of CEQA pursuant to 14 California Code of Regulations Section 15262, since it involves only feasibility or planning studies for possible future actions which have not yet been approved, adopted, or funded. As also required by Section 15262, the proposed project is intended provide information needed to consider and assess environmental factors associated with the project.

Staff will file a Notice of Exemption upon approval of the proposed project.